

REPORT ON INSPECTION OF INSECT CONTROL AREAS AND INFESTATIONS  
ON THE DURANGO-SAN JUAN FOREST

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Insect Control,  
Durango-San Juan.

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In order to determine the extent of infestation on the Durango-San Juan Forest and the results of the control measures undertaken during the past few years, I spent from April 18 to May 15 inspecting the yellow pine stands on the above mentioned Forest. The oldest control work dates from 1917. In that year two areas were worked over, one on Elbert Creek near Electra Lake, and one on Pine River. No additional work has been done on the former, and the latter was included in the more extensive project carried on during 1919 and 1920.

The original amount of timber cut, and peeled or burned, on Elbert Creek was not computed in terms of feet B.M., but the report shows 250 trees cut of an average diameter of 13.1 inches. The inspection of the area on April 22, 1921, shows 31 trees infested with an average diameter of 13.3 inches, so that the average board foot contents of the trees infested now is about the same as in 1917. Taking the loss of 1917 as 100%, the 1921 loss is 12.4% of the original found when control work was undertaken. About the same amount of timber was killed on the area in 1920 as in 1921.

In July 1918, Mr. Ralph Hopping visited this area and found 7 trees had been infested in the fall of 1917, and 20 in July 1918. These seven trees may be considered as the nuclei

Copy for Information.

Mr. Miller.



from which present infestation has grown so that a table of infestation becomes as follows:

<u>Year of Emergence</u>	<u>No. Trees</u>	<u>Percent of 1917 Infestation.</u>
1918	7	2.8%
1919	20	8.0%
1920	30	12.0%
1921	31	12.4%

Also, at the time of his visit, Mr. Hopping established a check area adjacent to the Elbert Creek control area. Fifty-six trees were found infested which would die in 1919. My examination on April 21 showed 10 trees as having died in 1920 and 7 at present infested. Summarized, the history of the area for the past three years is:

<u>Year of Emergence</u>	<u>No. Trees</u>	<u>Volume Feet B. M.</u>	<u>Percent of 1918 Infestation</u>
1919	56	?	100.0%
1920	10	2,317	17.9%
1921	7	367	12.5%

The comparison of the control area and the check area shows an apparent anomaly in that the control area shows a slow increase, while the check area shows a sharp decrease. Moreover, the infestation present in the check area consists of weak-brooded trees while that on the control area is vigorous. On the former no groups of infested trees were found, while on the control area one group of 8 trees was killed in 1920 and immediately adjoining this group six trees are now infested, and other small groups were also found. Almost all present infestation can be traced back to heavily infested groups which



were cut in 1917 from which either some of the brood escaped, or the infestation was hidden in partially infested trees. This is no reflection on the manner in which the work was done, since the results secured were excellent considering the severity of the infestation and that only one year's work was done.

The Deep Creek area was cutover in 1919. Infestation in 1920 and 1921 is weak and scattered. The lack of vigor is shown by the fact that several of the trees of large diameter were infested in 1920, but not sufficiently to kill the trees. The 1920 broods emerged and reinfested the other portions of the trees and will succeed in killing them this year. The volumes infested by years are as follows:

	<u>No. Trees</u>	<u>Volume</u>	<u>Percent of Original Infestation</u>
1919	393	190,386°	
1921	14	8,549	5%

°(Cut spring of 1919)

The Pine River Project area represents the largest control project undertaken on this Forest. Work was carried on in 1917 and in 1919 and 1920. The volumes treated in 1917 were not computed in terms of feet B. M., but since the diameter and length of trunk peeled are given an effort has been made to determine this approximately.

<u>Year.</u>	<u>Volume</u>	<u>Number Trees</u>
1917	50,800	275
1918	(No control work done)	
1919	600,658	956
1920	240,828	314



The 1917 work was not extensive enough to have an appreciable effect on the area as a whole, but undoubtedly destroyed or reduced some of the worst centers of infestation. No work being done in 1918 gave the infestation a chance to increase with the result that it was heavy in the spring of 1919.

In 1920 approximately 2,500 acres of the area worked over in 1919 was covered again, but the amount of timber cut was small. The sum of the three years cuts may be considered as a fair indication of the annual loss on this control area prior to control work. On the area covered twice it was almost impossible to find a single tree in the spring of 1921. I made a count of trees which had died during 1920 and which showed infestation in 1921 so far as could be determined from riding up Pine River from the Vallecito Creek Bridge to the public camp ground. This count is as follows:

1920 - - - - 28 trees.  
1921 - - - - 12 trees.

The same procedure was carried out for the west slope of East Mountain, lying east of Vallecito Creek as far north as the Vallecito Club.

1920 - - - - 9 trees.  
1921 - - - - 3 trees.

On a unit as large as the Pine River control area it was impossible to attempt the tallying of all trees which contained infestation in 1921 or had died in 1920. I therefore selected a check area consisting of Root Creek and the small gulch to the east lying below the Forest Service trail. This



area of about 640 acres was cut over by control operations in 1919 and a total of 78,310 feet B. M. cut and peeled or burned. Ten trees which had died in 1920 were found, and one with 1921 infestation. This one tree had been partially infested in 1920 and reattacked in the summer, so that broods will emerge in 1921.

<u>Year</u>	<u>Trees Infested</u>	<u>Volume</u>	<u>Percent of Original</u>
Original			
Infestation	116	78,310	
1920 "	10	3,847	4.9%
1921 "	1	992	1.3%

The above figures show a decided drop from the first year following control to the second succeeding year. The figures for the Bridge area will show the same condition and a like situation was evident without exception over all the 1919 control areas. For the Pine River area as a whole I believe the figure of 1.3% is too low, but I feel sure that the infestation present now does not exceed 5% of that existing on the area when control work was undertaken.

On the Bridge area I made a tally of all trees which had died in 1920 and in which infestation was present in 1921.

<u>Year</u>	<u>Trees Infested</u>	<u>Volume</u>	<u>Percent of Original</u>
1919 Original			
Infestation	350	164,506	
1920 "	12	6,406	3.9%
1921 "	7	4,365	2.7%

The 1921 infestation was weak and scattering and two years has been required to kill some of the larger trees.

The results obtained from the 1919 operations are distinctly encouraging, but it is too early to state what will result from the scattered infestation still found within the



project area, although the figures for the Elbert Creek area and experience in other Districts, would forecast a gradual increase in the infestation. This is contradicted by the decrease on the Pine Creek and Bridge areas in the second year after the control work without additional control work being done in the interval.

In addition to investigations of control areas, I endeavored, as far as possible, to get a comprehensive idea of the infestation throughout the entire yellow pine type on the San Juan-Durango Forest. In the course of my examination I succeeded in visiting all the Ranger Districts except those of Rangers Price and Norris. Both these men have had some previous training in locating infestations and carrying out control measures, so they will be in a position to comment on conditions on their districts if different from those found elsewhere by me on the Forest.

Infestation is present everywhere throughout the yellow pine type, but with the exception of the McGirr holdings on Snowball and Fourmile Creeks, which will be discussed later, cannot be considered as epidemic. Brief comments on various watersheds and other units follow.

#### Barnes Mountain:

Toward north end infestation very scattered although damage has been very heavy in the past. Counted 24 dead trees on one acre, with an average diameter of about 20". Other like patches of frequent occurrence. Believe from 10 to 20% of timber has been killed. Present infestation somewhat heavier south of old Orofino road.



"CoveF (East of Deep Creek)

Infestation scattered. Found only eight infested trees.

Lightner Creek:

Scattered infestation only. About 75% of timber patented. Government holdings will probably be cutover within a few years, and no work needed.

Hermosa and Lower Animas River:

Infestation scattered, greatest frequency and concentration noticed on bench and in pockets west of the Pinkerton Ranger Station. Groups of three trees quite common, and scattered individuals frequent. This timber is most accessible logging chance on Hermosa District, and if any funds are allotted this district for control before the timber is sold, this would be a good area to work on. 1921 infestation shows an increase over 1920.

Crowbar, Sells, Beaver and Bear Creeks:

Area south of Bayfield-Pagosa Springs Highway heavily alienated and largely cutover. Infestation very scattered. Some fine stands of yellow pine on Beaver and Bear Creeks, partly alienated. Infestation more frequent than south of above highway, but in no place is it concentrated. Heaviest loss found south of Bear Mountain and North of Swift's Ranch. One group of 3 trees and one group of 4 trees, and scattered individuals. Loss quite heavy toward upper limits of pine type in mixed stand of white fir, Douglas fir and yellow pine,



the latter species alone being infested. Heavy stand south of Grassy Mountain also shows quite a few brown topped trees. This area almost entirely alienated.

No heavy infestation anywhere south of Pine River drainage, but scattered individuals and groups almost everywhere. May be 300 trees on Beaver and Bear Creek drainages as reported by Shaw, but not concentrated on any particular area.

Squaw Creek and Yellowjacket Creek:

More prevalent at low elevations than at the upper limits of the pine type. Nowhere heavy and usually consists of a tree here and there with only a few groups of two or more trees.

State Highway-Pine-Piedra Divide to Piedra Bridge:

Scattered individuals and small groups.

Piedra Canon - Piedra Bridge to Bridge Ranger Station:

Infested trees everywhere, but scattered. Above the box canon below First Fork and from First Fork to the Bridge Ranger Station infestation occurs mainly in groups. Counted 14 infested trees in one group along the trail about 2 miles above First Fork Bridge. Groups are relatively widely spaced and there is not much infestation between groups. No indication of any pronounced increase this year, and evidence of similar activities extending back for several years is present.

Houser Sale Area - San Juan River Drainage:

Only three infested trees found on sale area. Elsewhere on lower San Juan drainage the usual scattered infestation is present.



### Snowball and Fourmile Creek:

The only area of epidemic infestation found on trip. Trees are being killed largely in groups, but with scattered individuals in between groups. One bunch at section corner common to Sections 13 and 24, T. 36 N., R. 2 W., and Sections 18 and 19, T. 36 N., R. 1 W., E. M. P. M., shows in 1920 20 trees and in 1921, 31 trees infested. Ten chains north of same a group of 12 trees in 1920 has increased to 17 trees in 1921. I estimate the average infestation on this drainage at 150 trees per section.

This and surrounding heavily infested timber is largely alienated, forming part of the McGirr holdings. The Government holdings form such a relatively small part of the infestation unit that we are not warranted in doing any control work. Effective protection of Government timber would involve a large amount of work on private lands, the cost of which would be out of all proportion to the value of the Government holdings so protected.

This infestation is heavier than any that we have cut on any of the control projects carried out on the Durango-San Juan Forest. It is understood that C. W. Houser is negotiating for the timber on the McGirr holdings, and the cutting of the timber should largely reduce the infestation.

### Species Infesting:

About 95% of the infestation consists of the Black Hills beetle, (*Dendroctonus ponderosae*, Hopk.), the balance being almost equally divided between the southwestern pine



beetle (*D. approximatus*, Dietz), and (*D. barberi*, Hopk.)

*Dendroctonus ponderosae* was found in all stages from parent adults extending their galleries to large larvae. Up to May 15 no pupae or transformed adults were found. Evidently *D. approximatus* and *D. barberi* mature and emerge much earlier than *D. ponderosae*, since in most instances the 1921 broods were in the advanced pupal stage or had already transformed.

#### Methods of Control:

Peeling and burning were originally recommended by Mr. Hopping on the following basis:

"In the Durango areas there are not only many large trees attacked wholly, or in part, by *Dendroctonus barberi*, where we much burn, but probably 50% of the trees attacked wholly by *Dendroctonus ponderosae* are small enough to buck in piles and burn. To peel these small trees would nearly double the cost of control. This was demonstrated by the Rangers in the two small experimental projects of 1917. In larger trees peeling after the limbs are reached is a slow laborious job."

Commenting on the above, the prevalence of *D. barberi* in the areas examined by Mr. Hopping is undoubtedly correct, but for the yellow pine type as a whole, as previously pointed out, *D. ponderosae* is the important species, and the institution of control methods adapted to this insect will be satisfactory and the other species may be disregarded.

I agree with Mr. Hopping that the bucking up and burning of small trees and the tops of large trees is more economical than peeling, with this qualifying phrase added - if the condition of the woods is such that fires will not run. Experience with the use of fire covering the years 1919 and 1920 were not



entirely satisfactory since a great deal of time and effort were expended in holding the fire adjacent to the felled trees or corralling it after it got away. Conditions were such this spring from April 15 to May 5 that it would have been impossible to use fire with safety. In D. ponderosae infestations the peeling of the bark is sufficient unless the larvae have transformed. I believe therefore that we should abandon burning except when the woods are so moist that a tree can be fired and left in safety. Generally by the time the insects have transformed the forest is so highly inflammable that fire cannot be safely used, and control work should be discontinued.

Recommendations as to Future Work:

Unfortunately the yellow pine type on the Durango-San Juan is badly shredded with alienations and any work to be successful must necessarily embrace large areas of private holdings, from the owners of which no cooperation can be expected.

The only area found on which infestation is sufficiently concentrated to make work by a large crew feasible is that on Snowball and Fourmile Creeks, but since this is almost entirely in private ownership, the Government is not warranted in cleaning it up.

The only feasible method open for work on the scattered infestation is by two-man crews travelling with pack outfit and cleaning up trees wherever found. If an allotment of \$300 per annum could be made to each district Ranger within



the yellow pine type it would be possible to place two men in the field on each district for about six weeks each spring, say April 15 to May 31, and I feel sure that in a few years much of the scattered infestation could be eliminated. Every scattered tree or group must be considered as a potential menace of an epidemic infestation, and with these insects as widely scattered as they are, it is impossible to say whether at no distant date we may have a recurrence of the same conditions as occurred on Pine River and the Bridge area.

In the event that it becomes possible to place such "fly-crows" in the field, I believe they should work as follows:

First - Pick up such scattered infestation as may show up on the Deep Creek, Pine River and Bridge areas, and extend the control work to scattered infestation contiguous thereto.

Second - Cover additional units of merchantable and accessible yellow pine timber, where at least 50% of the stand by volume to be protected is the property of the United States.

While not in a position to name all the areas which would come under heading two above, I have in mind the "Cove" Junction Creek and Barnes Mountain on the LaPlata District; Lower Hermosa and the area to the west of the Pinkerton Ranger Station on the Hermosa District. From Sells Creek north to Grassy Mountain, largely on Bear and Beaver Creeks on the Pine District. Along the State Highway and on Squaw Creek and Yellow-jacket Creeks on the Chimney District. On Williams Creek and down the Piedra River Canon on the Piedra District.

Respectfully submitted,

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